

WHAT IS CLAIMED IS:

1. An antigenic peptide of less than 100 amino acids having an antigenic subsequence selected from the group consisting of X-KSSGKLISL-X (SEQ ID NO: 1), X-CNGRLYCGP-X (SEQ ID NO: 2), X-GTKLVCFAA-X (SEQ ID NO: 3), EATVVYPAP (SEQ ID NO: 7), TKTLIYGGA (SEQ ID NO: 8), KRIVIGPQT (SEQ ID NO: 9), CCGCLTCSV (SEQ ID NO: 10), SGRLYCHESW (SEQ ID NO: 11), FALSHYDKP (SEQ ID NO: 12), RPTLRFQGA (SEQ ID NO: 13), EGEFCKSSGKLISLCGDDPAK (SEQ ID NO: 14), EGEFCQTKLVCFAAAGDDPAK (SEQ ID NO: 15), EGEFCCNNGRLYCQPCGDDPAK (SEQ ID NO: 16), EGEFCCAGQLTCSVCGDDPAK (SEQ ID NO: 17), CSGRLYCHESWC (SEQ ID NO: 18), and TKTLIYQGA (SEQ ID NO: 19), wherein X is independently an amino acid or sequence of amino acids with the proviso that X is not identical to the amino acid or amino acids naturally flanking the subsequences in human immunodeficiency virus-1 (HIV-1).
2. An antigenic peptide of claim 1, wherein the antigenic subsequence is selected from the group consisting of X-KSSGKLISL-X (SEQ ID NO: 1), X-CNGRLYCGP-X (SEQ ID NO: 2), and X-GTKLVCFAA-X (SEQ ID NO: 3).
3. An antigenic peptide of claim 1, wherein the antigenic subsequence is selected from the group consisting of EATVVYPAP (SEQ ID NO: 7), TKTLIYGGA (SEQ ID NO: 8), KRIVIGPQT (SEQ ID NO: 9), CCGCLTCSV (SEQ ID NO: 10), SGRLYCHESW (SEQ ID NO: 11), FALSHYDKP (SEQ ID NO: 12), and RPTLRFQGA (SEQ ID NO: 13).
4. An antigenic peptide of claim 1, wherein the antigenic subsequence is selected from the group consisting of EGEFCCAGQLTCSVCGDDPAK (SEQ ID NO: 17), CSGRLYCHESWC (SEQ ID NO: 18), and TKTLIYQGA (SEQ ID NO: 19).
5. An antigenic peptide of claim 1, wherein the antigenic subsequence is selected from the group consisting of EGEFCKSSGKLISLCGDDPAK (SEQ ID NO: 14), EGEFCQTKLVCFAAAGDDPAK (SEQ ID NO: 15), EGEFCCNNGRLYCQPCGDDPAK (SEQ ID NO: 16), and EGEFCCAGQLTCSVCGDDPAK (SEQ ID NO: 17).

14), EGEFCQTKLVCFAAAGDPAK (SEQ ID NO: 15), and EGEFCCNGRLYCQPCGDKPAK (SEQ ID NO: 16).

6. A vaccine for protecting against HIV-1 infection comprising an antigenic peptide of less than 100 amino acids having an antigenic subsequence selected from the group consisting of X-KSSGKLISL-X (SEQ ID NO: 1), X-CNGRLYCGP-X (SEQ ID NO: 2), X-GTKLVCFAA-X (SEQ ID NO: 3), EATVVYPAP (SEQ ID NO: 7), TKTLIYGGA (SEQ ID NO: 8), KRIVIGPQT (SEQ ID NO: 9), CCGCLTCSV (SEQ ID NO: 10), SGRLYCHESW (SEQ ID NO: 11), FALSHYDKP (SEQ ID NO: 12), RPTLRFQGA (SEQ ID NO: 13), EGEFCKSSGKLISLCGDDPAK (SEQ ID NO: 14), EGEFCQTKLVCFAAAGDDPAK (SEQ ID NO: 15), EGEFCCNGRLYCQPCGDDPAK (SEQ ID NO: 16), EGEFCCAGQLTCSVCGDDPAK (SEQ ID NO: 17), CSGRLYCHESWC (SEQ ID NO: 18), and TKTLIYQGA (SEQ ID NO: 19) wherein X is independently an amino acid or sequence of amino acids with the proviso that X is not identical to the amino acid or amino acids naturally flanking the subsequences in HIV-1.

7. A vaccine of claim 5, wherein the antigenic subsequence is selected from the group consisting of X-KSSGKLISL-X (SEQ ID NO: 1), X-CNGRLYCGP-X (SEQ ID NO: 2), and X-GTKLVCFAA-X (SEQ ID NO: 3).

8. A vaccine of claim 5, wherein the antigenic subsequence is selected from the group consisting of EATVVYPAP (SEQ ID NO: 7), TKTLIYGGA (SEQ ID NO: 8), KRIVIGPQT (SEQ ID NO: 9), CCGCLTCSV (SEQ ID NO: 10), SGRLYCHESW (SEQ ID NO: 11), FALSHYDKP (SEQ ID NO: 12), RPTLRFAQ (SEQ ID NO: 13), EGEFCCAGQLTCSVCGDPAK (SEQ ID NO: 17), CSGRLYCHESWC (SEQ ID NO: 18), and TKTLIYQGA (SEQ ID NO: 19).

9. A vaccine of claim 6, ~~wherein~~ the antigenic subsequence is selected from the group consisting of EGEFCKSSGKLISLCGDDPAK (SEQ ID NO: 14), EGEFCQTKLVCFAAAGDDPAK (SEQ ID NO: 15), and EGEFCCNGRLYCQPCGDDPAK (SEQ ID NO: 16).

10. A peptide of claim 1, wherein the antigenic subsequence comprises an antigenic determinant that does not give rise to HIV-1-specific antibodies to more than twelve other antigenic determinants on HIV-1.

11. A method for raising antibodies against HIV-1, said method composition comprising an antigenic determinant selected from the group consisting of comprising administering to an animal competent to raise antibodies an amount of a X-KSSGKLISL-X (SEQ ID NO: 1), X-CNGRLYCGP-X (SEQ ID NO: 2), X-GTKLVCFAA-X (SEQ ID NO: 3), EATVVYPAP (SEQ ID NO: 7), TKTLIYGGA (SEQ ID NO: 8), KRIVIGPQT (SEQ ID NO: 9), CCGCLTCSV (SEQ ID NO: 10), SGRLYCHESW (SEQ ID NO: 11), FALSHYDKP (SEQ ID NO: 12), RPTLRFQGA (SEQ ID NO: 13), EGEFCKSSGKLISLCCGDPK (SEQ ID NO: 14), EGEFCQTKLVCFAAAGDPK (SEQ ID NO: 15), EGEFCCNGRLYCQPCGDPK (SEQ ID NO: 16), EGEFCCAGQLTCSVCGDPK (SEQ ID NO: 17), CSGRLYCHESWC (SEQ ID NO: 18), and TKTLIYQGA (SEQ ID NO: 19), wherein X is independently an amino acid or sequence of amino acids with the proviso that X is not identical to the amino acid or amino acids naturally flanking the subsequences in HIV-1, and further wherein the composition does not give rise to HIV-1-specific antibodies to more than twelve other antigenic determinants on HIV-1, said amount sufficient to raise antibodies in the animal.

12. A method of claim 11, wherein the antigenic determinant is selected from the group consisting of EATVVYPAP (SEQ ID NO: 7), TKTLIYGGA (SEQ ID NO: 8), KRIVIGPQT (SEQ ID NO: 9), CCGCLTCSV (SEQ ID NO: 10), SGRLYCHESW (SEQ ID NO: 11), FALSHYDKP (SEQ ID NO: 12), RPTLRFQGA (SEQ ID NO: 13), EGEFCCAGQLTCSVCGDPK (SEQ ID NO: 17), CSGRLYCHESWC (SEQ ID NO: 18), and TKTLIYQGA (SEQ ID NO: 19).

13. A method of claim 11, wherein the antigenic determinant is selected from the group consisting of EGEFCKSSGKLISLCCGDPK (SEQ ID NO: 14), EGEFCQTKLVCFAAAGDPK (SEQ ID NO: 15), and EGEFCCNGRLYCQPCGDPK (SEQ ID NO: 16).

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14. A binding protein which specifically binds to a peptide selected from the group consisting of: KSSGKLISL (SEQ ID NO: 4), CNGRLYCGP (SEQ ID NO: 5), GTKLVCFAA (SEQ ID NO: 6), EATVVYPAP (SEQ ID NO: 7), TKTLIYGGA (SEQ ID NO: 8), KRIVIGPQT (SEQ ID NO: 9), CCGCLTCSV (SEQ ID NO: 10), SGRLYCHESW (SEQ ID NO: 11), FALSHYDKP (SEQ ID NO: 12), RPTLRFQGA (SEQ ID NO: 13), EGEFCKSSGKLISLCGDDPAK (SEQ ID NO: 14), EGEFCQTKLVCFAAAGDDPAK (SEQ ID NO: 15), EGEFCCNGRLYCQPCGDDPAK (SEQ ID NO: 16), EGEFCCAGQLTCSVCGDDPAK (SEQ ID NO: 17), CSGRLYCHESWC (SEQ ID NO: 18), and TKTLIYQGA (SEQ ID NO: 19).

15. A binding protein of claim 14, wherein the protein is an antibody.

16. A method for inducing passive immunity in a host against HIV-1 said method comprising the step of administering an amount of antibody which specifically binds to a peptide selected from the group consisting of: KSSGKLISL (SEQ ID NO: 4), CNGRLYCGP (SEQ ID NO: 5), GTKLVCFAA (SEQ ID NO: 6), EATVVYPAP (SEQ ID NO: 7), TKTLIYGGA (SEQ ID NO: 8), KRIVIGPQT (SEQ ID NO: 9), CCGCLTCSV (SEQ ID NO: 10), SGRLYCHESW (SEQ ID NO: 11), FALSHYDKP (SEQ ID NO: 12), RPTLRFQGA (SEQ ID NO: 13), EGEFCKSSGKLISLCGDDPAK (SEQ ID NO: 14), EGEFCQTKLVCFAAAGDDPAK (SEQ ID NO: 15), EGEFCCNGRLYCQPCGDDPAK (SEQ ID NO: 16), EGEFCCAGQLTCSVCGDDPAK (SEQ ID NO: 17), CSGRLYCHESWC (SEQ ID NO: 18), and TKTLIYQGA (SEQ ID NO: 19), said amount sufficient to induce passive immunity against HIV-1.

17. A method for detecting HIV-1 in biological sample said method comprising contacting the sample with an antibody which specifically binds to a peptide selected from the group consisting of: KSSGKLISL (SEQ ID NO: 4), CNGRLYCGP (SEQ ID NO: 5), GTKLVCFAA (SEQ ID NO: 6), EATVVYPAP (SEQ ID NO: 7), TKTLIYGGA (SEQ ID NO: 8), KRIVIGPQT (SEQ ID NO: 9), CCGCLTCSV (SEQ ID NO: 10), SGRLYCHESW (SEQ ID NO: 11), FALSHYDKP (SEQ ID NO: 12), RPTLRFQGA (SEQ ID NO: 13), EGEFCKSSGKLISLCGDDPAK (SEQ ID NO: 14), EGEFCQTKLVCFAAAGDDPAK (SEQ ID NO: 15), EGEFCCNGRLYCQPCGDDPAK

(SEQ ID NO: 16), EGEFCCAGQLTCSVCGDPAK (SEQ ID NO: 17), CSGRLYCHESWC (SEQ ID NO: 18), and TKTLIYQGA (SEQ ID NO: 19) in an amount sufficient to detect the presence of HIV-1 in a sample and determining the binding of the antibody to the protein in the sample.

18. A method for detecting HIV-1-specific antibodies in a person suspected of being infected with HIV-1, said method comprising the step of incubating a biological sample from the person with an antigenic determinant selected from the group consisting of KSSGKLISL (SEQ ID NO: 4), CNGRLYCGP (SEQ ID NO: 5), GTKLVCF AA (SEQ ID NO: 6), EATVVYPAP (SEQ ID NO: 7), TKTLIYGGA (SEQ ID NO: 8), KRIVIGPQT (SEQ ID NO: 9), CCGCLTCSV (SEQ ID NO: 10), SGRLYCHESW (SEQ ID NO: 11), FALSHYDKP (SEQ ID NO: 12), RPTLRFQGA (SEQ ID NO: 13), EGEFCKSSGKLISLCGDPAK (SEQ ID NO: 14), EGEFCQTKLVCF AAAGDPAK (SEQ ID NO: 15), EGEFCCNGRLYCQPCGDPAK (SEQ ID NO: 16), EGEFCCAGQLTCSVCGDPAK (SEQ ID NO: 17), CSGRLYCHESWC (SEQ ID NO: 18), and TKTLIYQGA (SEQ ID NO: 19) in an amount sufficient to detect the presence of antibodies which bind to the antigenic determinant and determining the binding of the antibody to the antigenic determinant.

19. A method of selecting for antibodies specific to patients with long term nonprogression (LTNP) into AIDS said method comprising: (a) screening serum from LTNP patients for HIV-1-specific antibodies and comparing the antibodies to patients with AIDS.

20. A peptide specific to antibodies from patients with long term nonprogression (LTNP) into AIDS, said peptide generated via a method comprising:

(a) screening serum from LTNP patients for HIV-1-specific antibodies, and;

(b) comparing the antibodies to patients with AIDS.

21. A phage comprising a phagotope, wherein the phagotope further comprises an antigenic determinant specific to antibodies found in patients with long term nonprogression (LTNP) into AIDS.

22. A phage of claim 21, wherein the antigenic determinanat is selected from the group consisting of: KSSGKLISL (SEQ ID NO: 4), CNGRLYCGP (SEQ ID NO: 5), GTKLVCF AA (SEQ ID NO: 6), EATVVYPAP (SEQ ID NO: 7), TKTLIYGGA (SEQ ID NO: 8), KRIVIGPQT (SEQ ID NO: 9), CCGCLTCSV (SEQ ID NO: 10), SGRLYCHESW (SEQ ID NO: 11), FALSHYDKP (SEQ ID NO: 12), and RPTLRFQGA (SEQ ID NO: 13).

23. A phage of claim 21, wherein the antigenic determinant is selected from the group consisting of EATVVYPAP (SEQ ID NO: 7), TKTLIYGGA (SEQ ID NO: 8), KRIVIGPQT (SEQ ID NO: 9), CCGCLTCSV (SEQ ID NO: 10), SGRLYCHESW (SEQ ID NO: 11), FALSHYDKP (SEQ ID NO: 12), and RPTLRFQGA (SEQ ID NO: 13).

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